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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,767	12/21/2004	David Lior	1133/16	4902
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Mark M. Friedman Bill Polkinghorn 9003 Florin Way Upper Marlboro, MD 20772			EXAMINER KIM, TAE JUN	
			ART UNIT 3746	PAPER NUMBER
			MAIL DATE 04/08/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/518,767

Applicant(s)

LIOR, DAVID

Examiner

Ted Kim

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-6 and 8-31 is/are pending in the application.
- 4a) Of the above claim(s) 10-23 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25, 26 and 29 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-6, 8, 9, 24, 27, 28, 30 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

6DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4, 5, 9, 28, 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Levesque (4,368,619). Levesque teaches an engine, comprising: a. a rotating assembly including a primary compressor 28, an inner casing 56 or alternately 68 and 58 together and a compressor-driving nozzle wheel 113; b. an outer casing 10, enclosing said rotating assembly; and c. a single substantially annular flame holder (wall 40a acts as a flameholder for the secondary combustion chamber as fuel from 126 impinges on it and presents a relatively small portion of the secondary combustion chamber 82) encircling said inner casing 56 within said combustion chamber; so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing 10 does not rotate with said rotating assembly; wherein said at least one combustion chamber is substantially a single annular combustion chamber 82; wherein said flame holder is included in said rotating assembly; wherein said rotating assembly further includes at least one fuel injector 122; a combustion chamber compressor (innermost portion of 64), coaxial with and radially

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inward from one of said at least one combustion chamber, said combustion chamber compressor 64 being configured to counteract axial backflow in said one combustion chamber (note that the blades 64 are taught as providing compression, see col. 3, lines 48+, and has an analogous configuration of the combustion chamber to applicant's Figs. 3, 4 and thus will also inherently counteract the axial backflow by the compression caused by the blades).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 8, 9, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karlby et al (2,784,551) in view of Chiang et al (5,782,079). Karlby et al teach an engine, comprising: a. a rotating assembly including a primary compressor 59, an inner casing 49 and a compressor-driving nozzle wheel 75; b. an outer casing 11, enclosing said rotating assembly; and c. an array of flame holder 71 encircling said inner casing within said combustion chamber; so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing 11 does not rotate with said rotating assembly; wherein said at least one combustion chamber 61 is

substantially a single annular combustion chamber; wherein said rotating assembly further includes at least one fuel injector 57; a rotating diffuser (exit ends of compressor blades 65, 59) between said primary compressor and said combustion chamber; said rotating diffuser includes extensions to terminal blades of said primary compressor (65, 59), note that col. 4, lines 2-12, specifically teach the terminal ends of the compressor blades form diffusion zones. Karlby et al teach the flame holder can be any suitable construction (col. 6, lines 72+) and that the advantage of the flameholders is to increase the capacity of the combustion chamber and reduce the size of the combustion chamber (col. 4, lines 13-24). Karlby et al do not specifically state the flame holder is a single annular flame holder. Chiang et al teach a single annular flame holder 55 for a combustion chamber of a gas turbine which serves to stabilize the flame and allow for complete combustion (col. 3, lines 35+). It would have been obvious to one of ordinary skill in the art to employ a single annular flame holder, as taught by Chiang et al, as consistent with the teaching of using any suitable construction of Karlby et al, which allow stabilizing the flame and facilitating complete combustion in a gas turbine combustor environment.

5. Claims 1, 2, 4, 5, 9, 28, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levesque (4,368,619) in view of Karlby et al (2,784,551) and Chiang et al (5,782,079). Levesque teaches an engine, comprising: a. a rotating assembly including a primary compressor 28, an inner casing 56 or alternately 68 and 58 together and a compressor-driving nozzle wheel 113; b. an outer casing 10, enclosing said rotating

assembly; and c. a single substantially annular flame holder (wall 40a acts as a flameholder for the secondary combustion chamber as fuel from 126 impinges on it and presents a relatively small portion of the secondary combustion chamber 82) encircling said inner casing 56 within said combustion chamber; so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing 10 does not rotate with said rotating assembly; wherein said at least one combustion chamber is substantially a single annular combustion chamber 82; wherein said flame holder is included in said rotating assembly; wherein said rotating assembly further includes at least one fuel injector 122; a combustion chamber compressor (innermost portion of 64), coaxial with and radially inward from one of said at least one combustion chamber, said combustion chamber compressor 64 being configured to counteract axial backflow in said one combustion chamber (note that the blades 64 are taught as providing compression, see col. 3, lines 48+, and has an analogous configuration of the combustion chamber to applicant's Figs. 3, 4 and thus will also inherently counteract the axial backflow by the compression caused by the blades). In an alternate treatment of Levesque, applicant alleges that there are no flameholders within the combustion chamber of Levesque. Karlby et al is applied as a teaching reference which specifically teaches in these rotating combustor arrangements a rotating flame holder of any suitable construction (col. 6, lines 72+) results in increasing the capacity of the combustion chamber and reducing the size of the combustion chamber (col. 4, lines

13-24). Karlby et al do not specifically state the flame holder is an annular flame holder. However, Chiang et al teach a single annular flame holder 55 for a combustion chamber of a gas turbine which serves to stabilize the flame and allow for complete combustion (col. 3, lines 35+) and it is noted that this v-gutter configuration is one of the oldest known in the art. It would have been obvious to one of ordinary skill in the art to employ a single annular flame holder, in at least one of the combustion chamber of Levesque, as taught by Karlby et al and Chiang et al, to facilitate stabilizing the flame and facilitating complete combustion in a gas turbine combustor environment and allows reducing the size of the combustion chamber.

6. Claims 1, 2, 4, 5, 8, 9, 24, 27, 28, 30, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mortimer (2,793,496) in view of Karlby et al (2,784,551) and Chiang et al (5,782,079) and optionally in view of Levesque (4,368,619). Mortimer teaches an engine, comprising: a. a rotating assembly including a primary compressor B', an inner casing G and a compressor-driving nozzle wheel E, E'; b. an outer casing C³, enclosing said rotating assembly; so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing C³ does not rotate with said rotating assembly; wherein said at least one combustion chamber is substantially a single annular combustion chamber; a substantially tubular element O surrounding said inner casing G, wherein a leading edge of said tubular element is positioned aft of said primary compressor B' so as to divide airflow from said primary

compressor into an outer airflow and an inner airflow, wherein said outer airflow is between said tubular element O and said outer casing C³ and wherein said inner airflow is between said tubular element O and said inner casing G. Mortimer do not teach a substantially annular flame holder encircling said inner casing within said combustion chamber nor the rotating diffuser. Karlby et al is applied as a teaching reference which specifically teaches in the flame holder can be of any suitable construction (col. 6, lines 72+) and results in increasing the capacity of the combustion chamber and reducing the size of the combustion chamber (col. 4, lines 13-24). Karlby et al teach a rotating diffuser (exit ends of compressor blades 65, 59) between said primary compressor and said combustion chamber; said rotating diffuser includes extensions to terminal blades of said primary compressor (65, 59), note that col. 4, lines 2-12, specifically teach compressor blades form diffusion zones and allows pressure recovery prior to combustion. Karlby et al do not specifically state the flame holder is an annular flame holder. Karlby et al do not specifically state the flame holder is a single annular flame holder. Chiang et al teach a single annular flame holder 55 for a combustion chamber of a gas turbine which serves to stabilize the flame and allow for complete combustion (col. 3, lines 35+). It would have been obvious to one of ordinary skill in the art to employ a single annular flame holder, as taught by Chiang et al, as consistent with the teaching of using any suitable construction of Karlby et al, which allow stabilizing the flame and facilitating complete combustion in a gas turbine combustor environment. It would have been obvious to one of ordinary skill in the art to employ a rotating diffuser with the

compressor blades of Mortimer, as taught by Karlby et al, in order to allow for pressure recovery prior to combustion. As for the compressor chamber compressor, Levesque teaches a combustion chamber compressor (innermost portion of 64), coaxial with and radially inward from one of said at least one combustion chamber, said combustion chamber compressor 64 being configured to counteract axial backflow in said one combustion chamber (note that the blades 64 are taught as providing compression, see col. 3, lines 48+, and has an analogous configuration of the combustion chamber to applicant's Figs. 3, 4 and thus will also inherently counteract the axial backflow by the compression caused by the blades). It would have been obvious to one of ordinary skill in the art to employ compressor blades between the rotating walls O, G2, in a manner taught by Levesque, in order to facilitate connection between the rotating elements of Mortimer, as well as providing additional compression.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mortimer (2,793,496) in view of Karlby et al (2,784,551) and Chiang et al (5,782,079) and optionally in view of Levesque (4,368,619), as applied above, and further in view of Danis et al (6,474,070). Mortimer teaches various aspects of the claimed invention including the substantially tubular element O, but does not teach using perforations in the tubular element. However, using perforations that location of the combustor chamber is well known in the art, as evidenced by Danis et al who uses perforations 54 to enhance the combustion process or perforations 56 to enhance the cooling of the combustor liner or perforations 58 to control the temperature profiler at the combustor outlet (col. 5, lines

23-44). It would have been obvious to one of ordinary skill in the art to employ perforations in the tubular element of Mortimer, in order to enhance the combustion process and/or to enhance the cooling of the combustor liner and/or to control the temperature profiler at the combustor outlet.

Allowable Subject Matter

8. Claims 25, 26, 29, are allowed.

Response to Arguments

9. Applicant's arguments filed 01/15/2008 have been fully considered and are persuasive with regard to the Guirguis reference but they are not persuasive with respect to the Levesque (4,368,619). Furthermore, to also address the new limitation of the single substantially annular flame holder, Chiang et al is now cited to teach that feature.

10. With regard to applicant's arguments concerning Levesque, applicant argues that

Claim 1 recites a rotating assembly and an outer casing, such that at least one combustion chamber is defined in the space therebetween. In the case of Lévesque '619, the two combustion chambers are not defined by the outer casing (housing 10) but by other components (extension 40a, annular wall 82 and vanes 88). If claim 1 had recited "...there being at least one combustion chamber defined in the space between etc." then it could be argued that, to that extent, claim 1 is anticipated by Lévesque '619. But this is not what claim 1 recites. Claim 1 recites "so that at least one combustion chamber is defined in the space between etc." (emphasis added).

Applicant's arguments have been carefully considered. However, "so that at least one combustion chamber is *defined in the space between* said primary compressor, said inner

casing, said compressor-driving nozzle wheel and said outer casing ..” does not exclude the presence of additional elements therewithin to define the combustion chamber. For example, applicant's own Fig. 3 designates the combustion chamber as 47 and there are additional elements therein such as walls 62, 79 and the combustion chamber compressor 66. Levesque has a highly analogous structure with additional walls and compressor blades therein, hence, the claim language clearly does not avoid the Levesque reference. With regard to applicant's argument concerning the single annular flame holder, applicant's arguments concerning the turbulence and mixing within the combustion chambers has been given full consideration. However, in Levesque, 40a forms a flame holder for the secondary combustion chamber as the fuel from 126 contacts this wall and the centrifugal forces will tend to hold the flame in that region rather than on the radially inner portion of the secondary combustion chamber. Hence, 40a will clearly serve as flame holder in terms of its limited zone of combustion within the secondary combustion chamber.

Applicant's arguments with regard to Karlby in combination or on Levesque in view of Karlby and either Spaddaccini or Pillsbury, rely on the amended “single” annular flameholder. Chiang is now cited to address this limitation.

Applicant's arguments with regard to Mortimer in combination are not persuasive. Mortimer merely lacks the flameholders, and Karlby amply provides motivation for a rotating combustor to use a flameholder. The precise structure of the flameholder to be a

single annular flameholder in terms of the v-gutter configuration used by Chiang et al is one of the most highly conventional flameholder configurations employed in the art.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax number for the organization where this application is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer, can be reached at 571-272-7118. Alternate inquiries to Technology Center 3700 can be made via 571-272-3700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

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